SEQUENCE LISTING

<110> Rondon, Isaac J
     Ladner, Robert C

<120> BINDING PEPTIDES FOR CARCINOEMBRYONIC ANTIGEN (CEA)

<130> Sequence Listing DYX-016.0 US

<140> (not yet assigned)
<141> 2000-04-03

<160> 107

<170> PatentIn Ver. 2.1

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<220>
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     polypeptide

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<223> Xaa is Trp

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<222> (6)

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<223> Xaa is Asn, Leu, Met or Phe

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<400> 1

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 1               5                    10                  15
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<210> 2
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<220>
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<222> (16)
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Xaa Trp Val Cys Glu Xaa Xaa Lys Xaa Gln Trp Xaa Cys Asn Xaa Xaa
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<220>
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<220>
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<222> (9)
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Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys
  1   5   10

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<211> 16
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<220>
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      polypeptide

<400> 4
Asn Trp Val Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asn Ser Tyr
  1   5   10   15

<210> 5
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 5
Asp Trp Val Cys Glu Asn Lys Lys Asp Gln Trp Thr Cys Asn Leu Leu
  1   5   10   15

<210> 6
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 6
Asn Trp Asp Cys Met Phe Gly Ala Glu Gly Trp Ala Cys Ser Pro Trp
 1   5   10   15

<210> 7
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 7
Asp Trp Val Cys Glu Lys Thr Thr Gly Gly Tyr Val Cys Gln Pro Leu
 1   5   10   15

<210> 8
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 8
Asn Trp Phe Cys Glu Met Ile Gly Arg Gln Trp Gly Cys Val Pro Ser
 1   5   10   15

<210> 9
<211> 16
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 9
Asp Trp Val Cys Asn Phe Asp Gln Gly Leu Ala His Cys Phe Pro Ser
 1   5   10   15

<210> 10

6

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<211> 12
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<220>
<223> Description of Artificial Sequence: parental
      domain for design of microprotein display library

<220>
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<222> (1)..(12)
<223> amino acid positions 4 and 9 are invariant Cys;
      all other positions Xaa are varied but not Cys, to
      provide a library of 2x10(8) different peptides
      based on the template sequence

<400> 10
Xaa Xaa Xaa Cys Xaa Xaa Xaa Xaa Cys Xaa Xaa Xaa
  1               5                   10


<210> 11
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<220>
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<223> amino acid positions 3 and 9 are invariant Cys;
      all other positions Xaa are varied but not Cys, to
      provide a library of 1x10(9) different peptides
      based on the template sequence

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Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa
  1               5                   10


<210> 12
<211> 12
<212> PRT
<213> Artificial Sequence
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<223> amino acid positions 3 and 10 are invariant Cys;
      all other positions Xaa are varied but not Cys, to
      provide a library of 1x10(9) different peptides
      based on the template sequence

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Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa
 1   5   10

<210> 13
<211> 16
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<220>
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      all other positions Xaa are varied but not Cys, to
      provide a library of 2.5x10(8) different peptides
      based on the template sequence

<400> 13
Xaa Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Xaa
 1   5   10   15

<210> 14
<211> 16
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      secondary library

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<220>
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<223> Xaa is any amino acid except Cys


<220>
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<222> (5)..(6)
<223> Xaa is any amino acid except Cys


<400> 14
Xaa Xaa Xaa Cys Xaa Xaa Lys Lys Asp Gln Trp Thr Cys Asn Leu Leu
 1               5                   10                  15



<210> 15
<211> 16
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<223> Xaa is any amino acid except Cys


<400> 15
Asp Trp Val Cys Xaa Xaa Xaa Xaa Xaa Gln Trp Thr Cys Asn Leu Leu
 1               5                   10                  15



<210> 16
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<220>
<223> Description of Artificial Sequence: variable
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<222> (8)..(12)
<223> Xaa is any amino acid except Cys

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  1   5   10   15

<210> 17
<211> 16
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<213> Artificial Sequence

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<223> Xaa is any amino acid except Cys

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<223> Xaa is any amino acid except Cys

<400> 17
Asp Trp Val Cys Glu Asn Lys Lys Asp Gln Xaa Xaa Cys Xaa Xaa Xaa
  1   5   10   15

<210> 18
<211> 16
<212> PRT
<213> Artificial Sequence

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      secondary library

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<223> Xaa is any amino acid except Cys

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<220>
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<223> Xaa is any amino acid except Cys


<400> 18
Asp Trp Val Cys Glu Xaa Xaa Lys Xaa Gln Trp Xaa Cys Asn Xaa Leu
 1               5                  10                  15



<210> 19
<211> 16
<212> PRT
<213> Artificial Sequence


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      secondary library


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<223> Xaa is any amino acid except Cys


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<400> 19
Asn Trp Val Cys Xaa Xaa Xaa Lys Xaa Gln Trp Xaa Cys Asn Ser Tyr
 1               5                  10                  15
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<210> 20
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<222> (14)..(16)
<223> Xaa is any amino acid except Cys

<400> 20
Xaa Trp Xaa Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Xaa Xaa Xaa
 1   5   10   15

<210> 21
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate of
      TN10/9 library found not to bind CEA

<400> 21
Asn Trp Arg Cys Lys Leu Phe Pro Arg Tyr Pro Tyr Cys Ser Ser Trp
 1   5   10   15

<210> 22
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate of
      TN10/9 library found not to bind CEA

<400> 22
Arg Tyr Cys Glu Phe Phe Pro Trp Ser Leu His Cys Gly Arg Pro
 1   5   10   15

<210> 23
<211> 16
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<220>
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      amino acid positions in first family of CEA
      binding peptides

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<223> X is Asn, Leu, Met or Phe

<220>
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<222> (9)
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<222> (12)
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<220>
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<222> (15)
<223> X is Arg, Leu, Pro or Ser

<400> 23

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Asp Trp Val Cys Glu Xaa Xaa Lys Xaa Gln Trp Xaa Cys Asn Xaa Leu
1               5                   10                  15
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<210> 24
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic CEA
      binding peptide with C-terminal immobilization
      sequence

<400> 24
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Ser Asn Trp Val Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asn Ser
1               5                   10                  15

Tyr Ala Pro Gly Gly Glu Gly Gly Gly Ser Lys
            20                  25
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<210> 25
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic CEA
      binding peptide with C-terminal immobilization
      sequence

<400> 25
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Ser Asp Trp Val Cys Glu Asn Lys Lys Asp Gln Trp Thr Cys Asn Leu
1               5                   10                  15

Leu Ala Pro Gly Gly Glu Gly Gly Gly Ser Lys
            20                  25
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<210> 26
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic CEA
      binding peptide with C-terminal immobilization

sequence

<400> 26
Ser Asn Trp Asp Cys Met Phe Gly Ala Glu Gly Trp Ala Cys Ser Pro
1   5   10   15

Trp Ala Pro Gly Gly Glu Gly Gly Gly Ser Lys
            20   25

<210> 27
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic CEA
      binding peptide with C-terminal immobilization
      sequence

<400> 27
Ser Asp Trp Val Cys Glu Leu Thr Thr Gly Gly Tyr Val Cys Gln Pro
1   5   10   15

Leu Ala Pro Gly Gly Glu Gly Gly Gly Ser Lys
            20   25

<210> 28
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: C-terminal
      sequence for immobilizing peptides

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Ala Pro Gly Gly Glu Gly Gly Gly Ser Lys
1   5   10

<210> 29
<211> 16
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<220>

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<223> Description of Artificial Sequence: template
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<220>
<221> VARIANT
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<223> X is any amino acid except Cys

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Xaa Xaa Xaa Cys Xaa Xaa Lys Lys Asp Gln Trp Thr Cys Asn Leu Leu
    1   5   10   15

<210> 30
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    1   5   10   15

<210> 31
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<220>
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 1               5                  10                  15



<210> 32
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<220>
<223> Description of Artificial Sequence: template
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<223> X is any amino acid except Cys


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<221> VARIANT
<222> (14)..(16)
<223> X is any amino acid except Cys


<400> 32
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 1               5                  10                  15



<210> 33
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<222> (6)..(7)
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<400> 33
Asp Trp Val Cys Glu Xaa Xaa Lys Xaa Gln Trp Xaa Cys Asn Xaa Leu
 1   5   10   15

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<220>
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<223> X is any amino acid except Cys

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Asn Trp Val Cys Xaa Xaa Xaa Lys Xaa Gln Trp Xaa Cys Asn Ser Tyr
 1               5                   10                  15


<210> 35
<211> 16
<212> PRT
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<223> X is any amino acid except Cys

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<223> X is any amino acid except Cys

<220>
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<222> (14)..(16)
<223> X is any amino acid except Cys

<400> 35
Xaa Trp Xaa Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Xaa Xaa Xaa
 1               5                   10                  15


<210> 36
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<220>
<223> Description of Artificial Sequence: family of CEA
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<220>
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<223> Xaa is Asp, Asn, Ala or Ile
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<220>
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<223> Xaa is Val, Ile, Met, Tyr, Phe, Pro or Asp


<220>
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<223> Xaa is Asn, Glu or Asp


<220>
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<222> (6)
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<220>
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<222> (7)
<223> Xaa is Phe, Leu, Asp, Glu, Ala, Ile, Lys, Asn,
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<220>
<221> VARIANT
<222> (8)
<223> Xaa is Lys, Phe, Asp, Gly, Leu, Asn or Trp


<220>
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<223> Xaa is Asn, Pro, Phe, Gly, Asp, Ala, Ser, Glu, Gln
      or Trp


<220>
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<222> (10)
<223> Xaa is Gln or Lys


<220>
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<222> (12)
<223> Xaa is Phe, Thr, Met, Ser, Ala, Asn, Val, His,
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<220>
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<222> (16)
<223> Xaa is Leu, Met, Val, Tyr, Ala, Ile, Trp, His,
      Pro, Gln, Glu, Phe, Lys or Arg

<400> 36
Xaa Trp Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Trp Xaa Cys Xaa Xaa Xaa
  1   5   10   15

<210> 37
<211> 16
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 37
Asp Trp Met Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Leu Met
  1   5   10   15

<210> 38
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 38
Asp Trp Val Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Leu Met
  1   5   10   15

<210> 39
<211> 16

21

<212> PRT
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<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 39
Asp Trp Ile Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Gln Met
  1   5   10   15

<210> 40
<211> 16
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<220>
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      polypeptide

<400> 40
Asn Trp Ile Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Gln Glu
  1   5   10   15

<210> 41
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 41
Asp Trp Ile Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Gln Val Lys
  1   5   10   15

<210> 42
<211> 16
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<220>
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      polypeptide

<400> 42
Asp Trp Val Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Val Met
1   5   10   15

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<220>
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      polypeptide

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Asp Trp Met Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Gln Ile
1   5   10   15

<210> 44
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<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 44
Ile Trp Asp Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Pro Ala Pro
1   5   10   15

<210> 45
<211> 16
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<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 45
Asp Trp Ile Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Ile Arg
1   5   10   15

<210> 46
<211> 16
<212> PRT
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<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 46
Asp Trp Met Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Val Val
 1   5   10   15

<210> 47
<211> 16
<212> PRT
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<220>
<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 47
Asp Trp Ile Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Ala Ile
 1   5   10   15

<210> 48
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 1   5   10   15

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 1   5   10   15

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 1   5   10   15

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<210> 53
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 1   5   10   15

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 1   5   10   15

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      polypeptide

<400> 56

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      polypeptide

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  1   5   10   15

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Asp Trp Val Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Asp Val Trp
  1   5   10   15

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<223> Description of Artificial Sequence: CEA binding
      polypeptide

<400> 59

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1   5   10   15

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1   5   10   15

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1   5   10   15

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1   5   10   15

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 1   5   10   15

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 1   5   10   15

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1   5   10   15

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1   5   10   15

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1   5   10   15

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1   5   10   15

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        polypeptide

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Asp Trp Val Cys Glu Tyr Asn Asp Glu Gln Trp Thr Cys Asn Leu Leu
1   5   10   15

<210> 71
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1   5   10   15

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1   5   10   15

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<223> Description of Artificial Sequence: CEA binding
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1   5   10   15

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1   5   10   15

<210> 75
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1   5   10   15

<210> 76
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Asp Trp Val Cys Glu Phe Phe Lys Asp Gln Trp Ser Cys Asn Val Leu
1   5   10   15

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<210> 77
<211> 16
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1   5   10   15

<210> 78
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1   5   10   15

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      polypeptide

<400> 79
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1   5   10   15

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33

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 1   5   10   15

<210> 81
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 1   5   10   15

<210> 82
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 1   5   10   15

<210> 83
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<400> 83

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 1               5                   10                  15


<210> 84
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<400> 84
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 1               5                   10                  15


<210> 85
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 1               5                   10                  15


<210> 86
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<400> 86
Asp Trp Val Cys Glu Phe Phe Lys Lys Gln Trp Phe Cys Asn Leu Leu
 1               5                   10                  15


<210> 87
<211> 16
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<212> PRT
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<210> 88
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 1   5   10   15

<210> 89
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<400> 89
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 1   5   10   15

<210> 90
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      polypeptide

36

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1   5   10   15

<210> 91
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1   5   10   15

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1   5   10   15

<210> 93
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1   5   10   15

<210> 94
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 1   5   10   15

<210> 95
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<400> 95
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 1   5   10   15

<210> 96
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Asn Trp Val Cys Asn Leu Phe Lys Asn Gln Trp Phe Cys Glu Trp Ala
 1   5   10   15

<210> 97
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<223> Description of Artificial Sequence: CEA binding
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<400> 97
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 1   5   10   15

<210> 98
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 1   5   10   15

<210> 99
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 1   5   10   15

<210> 100
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 1   5   10   15

<210> 101
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      polypeptide

<400> 101
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 1   5   10   15

<210> 102
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<400> 102
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 1   5   10   15

<210> 103
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 1   5   10   15

<210> 104
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polypeptide

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1   5   10   15

<210> 105
<211> 16
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polypeptide

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1   5   10   15

<210> 106
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polypeptide

<400> 106
Asp Trp Val Cys Glu Phe Phe Gly Met Gln Trp Thr Cys Asn Leu Leu
1   5   10   15

<210> 107
<211> 16
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polypeptide

<400> 107

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Asp Trp Val Cys Glu Tyr Ala Lys Phe Gln Trp Ile Cys Asn Ile Leu
  1   5   10   15